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# The Growth Potential of Startups over the Business Cycle

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Newly created businesses are widely recognised as an important engine of job creation. A worrying recent development is that job creation by young firms has been exceptionally weak since the financial crisis. Possibly, this weakness does not only hold back current economic activity, but also future employment. This could be the case for example because it may take time to rebuild a reduction in the number of firms active in the economy.

In this paper we investigate the importance of firm entry stage for later outcomes. We do so by following *cohorts* of firms as they age. We find that, indeed, economic conditions at the time of firm creation are a very important determinant of a cohort's later success in providing employment. However, the most important concern that emerges is not that fewer new businesses enter the economy during a downturn, but rather that those that *do* enter do not grow very large.

Our analysis is based on annual employment data from the U.S. Business Dynamics Statistics database, covering the period 1979 until 2011. An important advantage of this data source is that it covers nearly all private employment. The data allow us to trace cohorts until five years after entry. We document that fluctuations in job creation by entrants are large and move in tandem with the aggregate business cycle. Moreover, deviations in employment level observed in the year the cohort is born tend to persist as the cohort ages. Finally, we document fluctuations in cohort-level employment are largely driven by fluctuations in average firm size within the cohort (average employment per firm) rather than fluctuations in the number of firms.

Next, we estimate an equilibrium firm dynamics model to quantify the importance of economic conditions at the time of firm entry more precisely, which would be difficult using reduced-form empirical techniques. The difficulty is that observed fluctuations in average size among entrants may reflect several causes that are not directly observed. For example, a reduction in average firm size among entrants during a recession may reflect a compositional change towards firms that are less suited to be scaled up and grow large. Alternatively, entrants may be smaller simply because the economy is in a recession, but nevertheless grow as large as other firms once the aggregate economy recovers. Within our structural model both distinct forces are present, because we model endogenous entry of firms with heterogeneous production technologies. These technologies differ in their degrees of "returns to scale", i.e. the extent to which expanding the firm reduces or increases

productivity. As a result of these differences in scalability, some firms are more likely grow large than others. In addition to modelling the firm entry decision, we model post-entry employment decisions.

The estimated model indicates that the firm entry stage is crucial: over 90 percent of the variation in employment across cohorts of the same age is determined by economic conditions at the time of entry. This is true even when comparing old cohorts. This result may seem surprising since one may expect the importance of the entry phase to fade out as cohort mature. However, what strengthens the importance of the entry stage is that differences in scalability across cohorts become increasingly pronounced as cohorts grow older. This is because upon entry all firms -either very scalable or less scalable- are relatively small. As time progresses, however, the highly scalable firms grow large whereas less scalable firms stay small.

We also use the model to evaluate the contribution of variations in economic conditions at the entry phase for aggregate outcomes. We find that variations in startup conditions account for large but slow-moving fluctuations in the aggregate employment rate, strikingly similar to the low-frequency component of aggregate employment delivered by statistical filters. Thus, we find that at the aggregate level changes in startup conditions manifest themselves especially at longer horizons.